REMARKS

Reconsideration of the above-identified patent application in view of the remarks following is respectfully requested. Claims 1-40 are pending in the application. Claims 1-9 have been rejected, claims 10-27 have been objected to and claims 28-40 have been allowed. Applicant gratefully acknowledges the allowance of claims 28-40 and the conditional allowance of claims 10-27. The Examiner's rejection of claims 1-9 is respectfully traversed.

The present invention is of a protocol for communicating data on a passive optical network (PON) conforming to the Ethernet standard. It provides processes for remote network node discovery and synchronization. Uplink packet transmissions to a central controller, such as an optical line terminal (OLT), are scheduled by the central controller. Downlink packets from the central controller to a remote network node, such as an optical network unit (ONU), are encrypted to preserve privacy, and the key used for encryption is changed periodically. The protocol further provides processes for detecting the loss of physical or logical connection between the central controller and the remote network nodes.

In contrast, neither of the references cited by the Examiner (Pearce et al. US 2002110155, hereinafter Pearce, and Matsumoto US 6,711,264, hereinafter Matsumoto) in his rejection deals with passive optical networks. Pearce deals with a optical fiber ring network used for motion control.. Matsumoto does not deal with optical networks at all.

The Examiner mentions an "Elliot" as a reference in his rejection of claims 3 - 5. Applicant believes this is an inadvertent error, and that the Examiner meant "Pearce".

§ 102 Rejections

Claims 1 and 2 were rejected under 35 U.S.C. 102(e) as being anticipated by Pearce et al. The Examiner's rejection is respectfully traversed.

Claim 1 of the present invention reads:

A method for transferring data between a central controller and a first node of a plurality of remote network nodes over a digital data network <u>having a passive optical network topology</u>, the network connecting the central controller and the plurality of remote network nodes, the method comprising the steps of:

a. discovering the first node by the central controller;

b. synchronizing the internal clock of the first node to the internal clock of the central controller; and

c. transmitting <u>uplink data from the first node to the central controller</u> in response to transmission authorizations sent by the central controller to the first node.

Pearce discloses (Abstract) a <u>motion control</u> system and method that includes a central controller configured to generate first and second demand control signals to be used to define <u>actuation motion</u> of respective first and second actuators. The central controller is in communication with first and second nodes by way of a data network, each node including at least a respective actuator configured to implement at an actuator time a motion or force-related effort based upon the respective demand control signal. Each node also includes a memory configured to store at least one respective propagation delay parameter related to a signal propagation delay between the central controller and the node. A timing mechanism establishes timing at each node based on the respective propagation delay parameter so that the actuator time at the nodes occurs simultaneously. Strictly cyclic and/or full-duplex high-speed communication can be supported. The network can be wired in a ring or as a tree and with twisted pair cabling or fiber. The central controller issues demand signals to the nodes that are actuator, servo motor drive, and/or I/O devices. The central controller can also provide a timing message that is used by the nodes, in conjunction with local delay correction circuitry, so that the simultaneous acquisition of data and the simultaneous implementation of controlled action occur.

Pearce's disclosure reads:

[0089] The network communication within the ring network 30 is in the form of short packets sent out from the master (motion controller) 36 at regular intervals to provide the demand signals, and short packets sent back from the nodes 32 and 34 to the master 36 at regular intervals to provide feedback and monitoring data. Not only must the regular intervals align with the control system loop rate at the point in the control cascade where the network 30 is inserted but a network time must be established so that all demands take effect simultaneously and all feedback is acquired simultaneously.

[0097] The discovery phase 60 describes operations whereby the nodes (such as, e.g., node 32 and 24 of FIG. 3) are discovered and enumerated (e.g., assigned address and other network parameters) by the master 36. Communication during the discovery phase 60 is asynchronous and the slave normally sends a telegram in response to one received from the master 36.

The "telegram" (claimed by the Examiner to parallel "uplink data" in claim 1) is explained as follows:

[0090] An example of a telegram 4 that would be transmitted from the master 36 is illustrated in FIG. 4. The telegram includes an address field 42, a control field 43, a data field 44, and a frame check sequence 45. The start of stream 41 and end of stream 46 delimiters delineate the telegram.

Pearce's "master controller" is a motion controller, not a PON controller (i.e. an OLT), which is defined in paragraph [0007] of the present invention as:

...A passive optical network typically includes a central controller, such as an optical line terminal, at the communication company's office, and a plurality of remote network nodes, such as optical network units or customer premises equipment, located near end-users of the network. In a PON, the central controller and the remote network nodes are interconnected by optical fiber and optical splitters/combiners.

It is clear that Pearce's controller ("master") has nothing in common whatsoever with the central controller (OLT) recited in claim 1. Further, Pearce's telegram (in a proprietary, non-Ethernet format) has nothing in common with uplink data transmitted in the PON of the present invention by a standard Ethernet format. Thus Pearce cannot anticipate claims 1 and 2, which refer specifically to PONs in which OLTs are the "central controllers". Moreover, Pearce does not even render obvious claim 1 (and consequently all its dependent claims), because one skilled in the art of motion control through a digital network would have no reason to apply teachings of motion control to PONs.

§ 103 Rejections

Claims 3-5 were rejected under 35 U.S.C. 103(a) as being unpatentable over Pearce in view of Matsumoto. Claims 6-9 5 were rejected under 35 U.S.C. 103(a) as being unpatentable over Pearce. The Examiner's rejection is respectfully traversed.

Pearce's invention deals with motion control through digital networks. As stated by him:

[0010] Several types of digital networks have been indicated for use in motion control. These networks can be divided up into two groups: those that have been designed for general purpose data transmission but then applied to motion control and those that are designed specifically for use as motion control networks.

PONs are, as their name implies, passive optical communication networks, which are not known to be applied to any kind of motion control. The communication between a central controller (OLT) of a PON and its nodes is essentially different that that between the motion controller and the nodes of Pearce's motion control system. Therefore, the downlink data sent through a PON and its encryption have nothing in common with encrypted data in a motion control use of a digital network. Adding the limitations of Matsumoto to Pearce's invention will still leave an invention dealing with motion control, not passive optical communications. This, Pearce in combination with Matsumoto cannot render claims 3-5 obvious. *Mutatis mutandis*, Pearce alone cannot render claims 6-9 obvious.

Objections

Claims 10-27 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims. The base claim of claim 10 is claim1, with claim 2 being the intervening claim. In view of the arguments above, Applicant submits that the objection is moot.

In view of the above amendments and remarks it is respectfully submitted that claims 1- 27 are now in condition for allowance in addition to allowed claims 28-40. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,

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Date: September 1, 2006